Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 7A Study Guide**

**Part 1. Mole Conversions**

|  |  |
| --- | --- |
| **Moles to Mass** | 1. Convert 5 moles of hydrogen into grams. 2. Convert 3 moles of oxygen into grams. |
| **Mass to Moles** | 1. Convert 61.94 grams of phosphorus into moles. 2. Convert 95 grams of fluorine into moles. |
| **Liters to Atoms** | 1. Convert 7 L of calcium into atoms. 2. Convert 4 L of Hafnium into atoms. |
| **Atoms to Grams** | 1. Convert 6.02x1025 atoms of iron into grams. 2. Convert 1.19 x 1013 atoms of lithium into grams. |

**Part 2. Percent Composition**

*Calculate the percentage of EACH element in the following compounds. Show all work.*

1. KNO3 K = \_\_\_\_\_\_\_\_\_\_% N = \_\_\_\_\_\_\_\_\_\_% O = \_\_\_\_\_\_\_\_\_\_%
2. H2SO4 H = \_\_\_\_\_\_\_\_\_\_% S = \_\_\_\_\_\_\_\_\_\_% O = \_\_\_\_\_\_\_\_\_\_%
3. C2H5OH C = \_\_\_\_\_\_\_\_\_\_% H = \_\_\_\_\_\_\_\_\_\_% O = \_\_\_\_\_\_\_\_\_\_%
4. C3H8 C = \_\_\_\_\_\_\_\_\_\_% H = \_\_\_\_\_\_\_\_\_\_%

**Part 3. Percent Error**

1. Neysha estimates the weight of her cat to be 10 pounds. The actual weight of the cat is 13.75 pounds. Calculate the percent error.
2. Each week Lili goes to the grocery store. Lili estimates that she will spend $120 when she goes to the grocery store this week. She actually spends $94 (such bargains!). Calculate the percent error.
3. Darrelle estimates that 230 will attend her chorus concert. The actual total that attended was 300 people. Calculate the percent error.

**Part 4. Empirical Formulas**

1. A compound is 44.82% Potassium, 18.39% Sulfur, and 36.79% Oxygen. Write the empirical formula.

|  |  |  |  |
| --- | --- | --- | --- |
| STEPS: | Element 1: \_\_\_\_\_\_\_ | Element 2: \_\_\_\_\_\_\_ | Element 3: \_\_\_\_\_\_\_ |
| 1. Convert from PERCENT to MASS |  |  |  |
| 2. Convert from MASS to MOLES |  |  |  |
| 3. Divide both numbers by the smallest number of moles |  |  |  |
| 4. Multiply both numbers by the same number so that they’re whole |  |  |  |
| 5. Write the empirical formula |  | | |

1. A compound is 52.0% Zinc, 9.6% Carbon, and 38.4% Oxygen. Calculate the empirical formula of the compound.

|  |  |  |  |
| --- | --- | --- | --- |
| STEPS: | Element 1: \_\_\_\_\_\_\_ | Element 2: \_\_\_\_\_\_\_ | Element 3: \_\_\_\_\_\_\_ |
| 1. Convert from PERCENT to MASS |  |  |  |
| 2. Convert from MASS to MOLES |  |  |  |
| 3. Divide both numbers by the smallest number of moles |  |  |  |
| 4. Multiply both numbers by the same number so that they’re whole |  |  |  |
| 5. Write the empirical formula |  | | |

**Part 5. Molecular Formulas**

1. What is the molecular formula of a compound with a formula mass of 32.06 g/mol and the empirical formula NH2?
2. What is the molecular formula of a compound with a formula mass of 92.0 g/mol and the empirical formula NO2?
3. Determine the molecular formula of the compound with an empirical formula of CH and a formula mass of 78.110 g/mol.